

M54583WP

8-UNIT 400mA DARLIGNON TRANSISTOR ARRAY

DESCRIPTION

M54583WP is eight-circuit collector-current sink type Darlington transistor arrays. The circuits are made of PNP and NPN transistors. Both the semiconductor integrated circuits perform high-current driving with extremely low input-current supply.

FEATURES

- High breakdown voltage ($BV_{CEO} \geq 50V$)
- High-current driving ($I_C(\max) = 400mA$)
- Active L-level input
- With input clamping diodes

APPLICATIONS

Interfaces between microcomputers and high-voltage, high current drive systems, drives of relays and printers, and MOS-bipolar logic IC interfaces

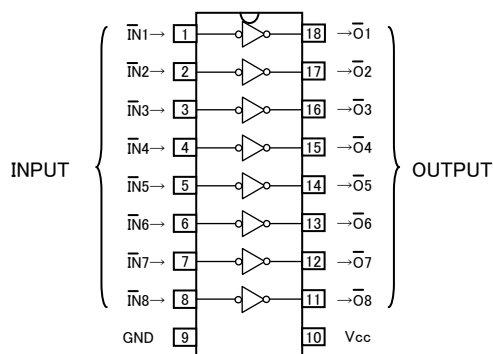
FUNCTION

The M54583 is produced by adding PNP transistors to M54523 inputs. Eight circuits having active L-level inputs are provided.

Resistance of $7k\Omega$ and diode are provided in series between each input and PNP transistor base. The input diode is intended to prevent the flow of current from the input to the V_{CC} . Without this diode, the current flow from "H" input to the V_{CC} and the "L" input circuits is activated, in such case where one of the inputs of the 8 circuits is "H" and the others are "L" to save power consumption. The diode is inserted to prevent such misoperation.

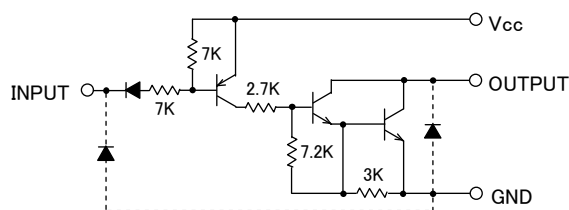
This device is most suitable for a driver using NMOS IC output especially for the driver of current sink. Collector current is 400mA maximum. Collector-emitter supply voltage is 50V.

PIN CONFIGURATION



Package type 18P4X

CIRCUIT DIAGRAM



The eight circuits share the V_{CC} and GND.
The diode, indicated with the dotted line, is parasitic, and cannot be used.

Unit: Ω

ABSOLUTE MAXIMUM RATINGS (Unless otherwise noted, $T_a = -20 \sim +75^\circ C$)

Symbol	Parameter	Conditions	Ratings	Unit
V_{CC}	Supply voltage		10	V
V_{CEO}	Collector-emitter voltage	Output , H	- 0.5 ~ + 50	V
V_i	Input voltage		- 0.5 ~ V_{CC}	V
I_C	Collector current	Current per circuit output, L	400	mA
P_d	Power dissipation	$T_a = 25^\circ C$, when mounted on board	1.79	W
T_{opr}	Operating temperature		- 20 ~ + 75	$^\circ C$
T_{stg}	Storage temperature		- 55 ~ + 125	$^\circ C$

8-UNIT 400mA DARLIGNON TRANSISTOR ARRAY

RECOMMENDED OPERATING (Unless otherwise noted, Ta = -20 ~ +75°C)

Symbol	Parameter	Limits			Unit	
		min	typ	max		
Vcc	Supply voltage	4	5	8	V	
Ic	Collector current (Current per 1 circuit when 8 circuits are coming on simultaneously)	Duty Cycle no more than 10%	0	—	350	mA
		Duty Cycle no more than 34%	0	—	200	
VIH	“H” input voltage	Vcc-0.7	—	Vcc	V	
VIL	“L” input voltage	0	—	Vcc-3.6	V	

ELECTRICAL CHARACTERISTICS (Unless otherwise noted, Ta = -20 ~ +75°C)

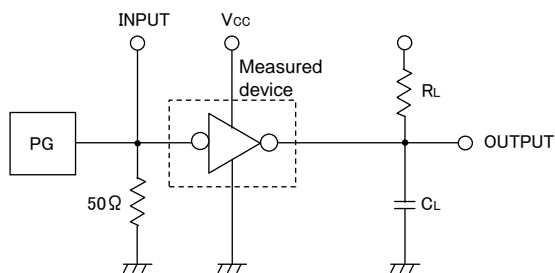
Symbol	Parameter	Test conditions	Limits			Unit	
			min	typ*	max		
V(BR)CEO	Collector-emitter breakdown voltage	Vs = 50V, VI = 0.2V	50	—	—	V	
VCE(sat)	Collector-emitter saturation voltage	VI = Vcc - 3.6V	Ic = 350mA	—	1.2	2.2	V
			Ic = 200mA	—	0.98	1.6	
Ii	Input current	VI = Vcc - 3.6V	—	-320	-600	μA	
ICC	Supply current (one circuit coming on)	Vcc = 5V, VI = Vcc - 3.6V	—	1.9	3.0	mA	
hFE	DC amplification factor	VCE = 4V, Vcc = 5V, Ic = 350mA, Ta = 25°C	2000	3500	—	—	

*: The typical values are those measured under ambient temperature (Ta) of 25°C. There is no guarantee that these values are obtained under any conditions.

SWITCHING CHARACTERISTICS (Unless otherwise noted, Ta = 25°C)

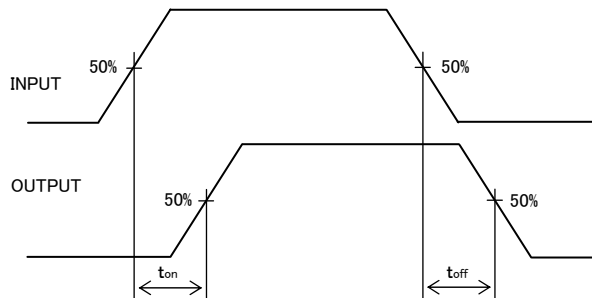
Symbol	Parameter	Test conditions	Limits			Unit
			min	typ	max	
ton	Turn-on time	CL = 15pF (note 1)	—	130	—	ns
toff	Turn-off time		—	3200	—	ns

NOTE 1 TEST CIRCUIT

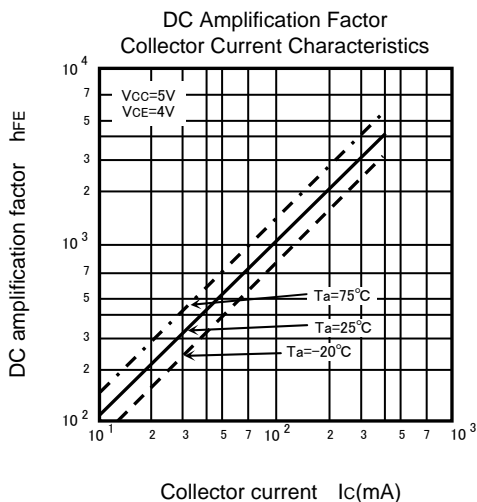
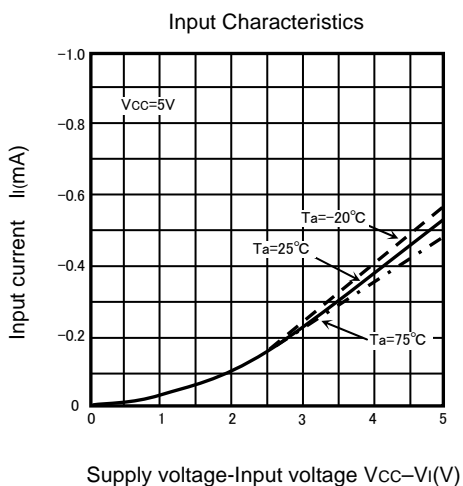
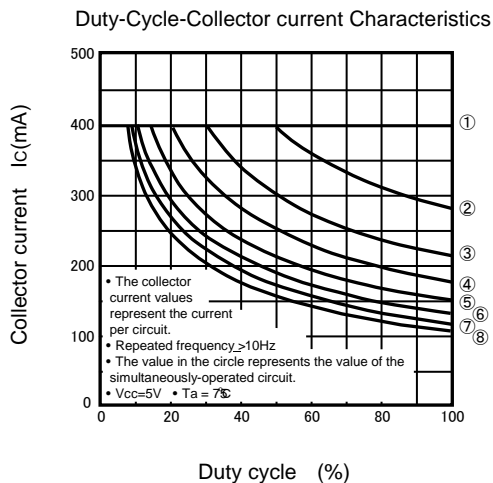
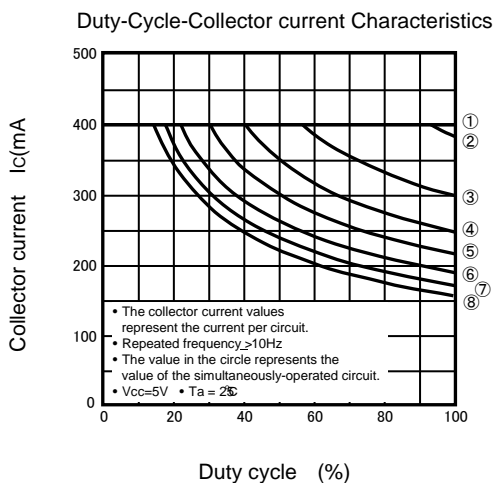
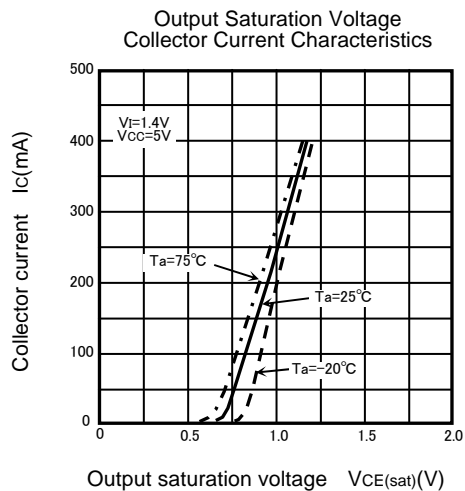
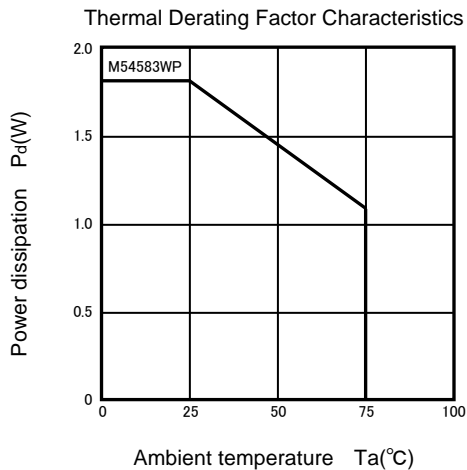


- (1) Pulse generator (PG) characteristics: PRR = 1kHz, tw = 10 μs, tr = 6ns, tf = 6ns, Zo = 50Ω, VI = 0.4 to 4V
- (2) Input-output conditions : RL = 30Ω, Vo = 10V, Vcc = 4V
- (3) Electrostatic capacity CL includes floating capacitance at connections and input capacitance at probes

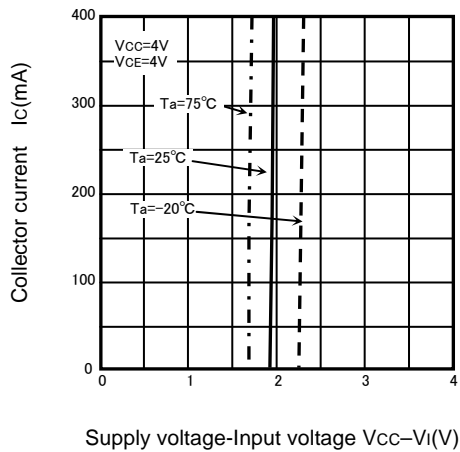
TIMING DIAGRAM



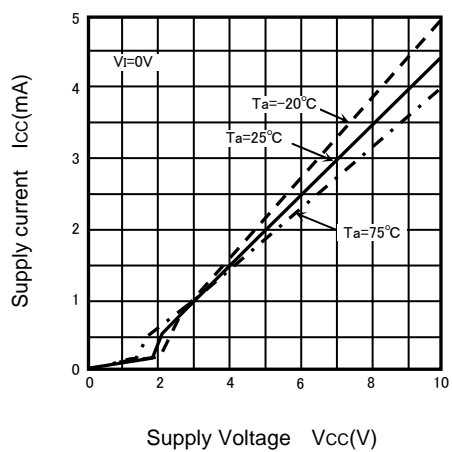
TYPICAL CHARACTERISTICS



Grounded Emitter Transfer Characteristics



Supply Current Characteristics



PACKAGE OUTLINE

18P4X

Plastic 18pin 300mil DIP

